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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,358	05/22/2001	Takehiko Kezuka	P07223US00/L	6873

881 7590 09/24/2002

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EXAMINER	
UMEZ ERONINI, LYNETTE T	
ART UNIT	PAPER NUMBER
1765	4

DATE MAILED: 09/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/856,358	KEZUKA ET AL.	
	Examiner	Art Unit	
	Lynette T. Umez-Eronini	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

1. The preliminary amendment of May 22, 2001 was received. However, the amendment could not be enforced because (Amended) claim 14 was not found. If applicant wants claim 14 amended, it can be submitted in the next office action.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

((b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1, 15, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Li (US 5,783,495).

Li teaches an etching solution comprising hydrofluoric acid, wherein a ratio of an etch rate of boron silicate glass film/ an etch rate of a thermal oxide film at 25°C is 10 ($378 \text{ Åmin}^{-1}/36 \text{ Åmin}^{-1}$) or higher (column 5, lines 48-50; column 6, lines 52-54 and 56-59; and Table 1). Li further teaches an etching method used in fabricating semiconductor devices, which reads on a method for producing an etched article by etching an article to be etched with the etching solution and an etched article, which is obtainable by the said method (column 1, lines 13-19).

Claim Rejections – 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li ('495) as applied to claim 1 above, and further in view of Grant et al. (US 5,439,553).

Li differs in failing to teach a solvent in the etching solution has a relative dielectric constant of 61 or lower, in claims 2-3.

Grant teaches an etchant comprising HF along with organic materials such as methanol, isopropanol, acetone and acetic acid (column 5, line 63 – column 6, line 6 and claims 3-5) and further teaches these solvents prevent condensation and other contaminants on the oxide surface (column 3, lines 43-54)

It is the examiner's position that it would have been obvious to one skilled in the art at the time of the claimed invention to modify Li by employing organic having a dielectric constant of less than 61 for the purpose of preventing deposition of contaminants of the substrate.

6. Claims 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li ('495) as applied to claim 1 above, and further in view of Grant ('439) and Bertens (US 3,968,565).

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Li in view of Grant differ in failing to teach in failing to specify the etchant composition as recited in claims 4-10.

Bertens teaches the chemical etching rate varies strongly with the composition of the etching liquid (column 2, lines 17-20), which suggests the composition of the etchant is variable.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Li in view of Grant by varying the composition of the etchant as taught by Bertens for the purpose of obtaining the best etched product.

7. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li ('495) as applied to claim 1 above, and further in view of McNeilly et al. (US 5,294,568).

Li differs in failing to teach the etching solution comprises an inorganic acid that has a pK_a of 2 or lower and the etching solution wherein the percent by weight ratio of HF: HCl:water is 0.01-50:1-36:0-99.

McNeilly teaches an etching solution comprising HCl (same as applicant's organic acid having a $pK_a = -8$, Specification, page 5, lines 7-9), 38.4 wt % HF from HF/H₂O and 20.2 wt % HCl from HCl/H₂O (column 6, lines 26-30, which lies within the range of the ratio of HF:HCl:water, which is 0.01-50:1-36:0-99. McNeilly further teaches exposing a substrate to hydrogen halide vapor and water vapor under appropriate conditions and long enough to remove the native oxide but not long enough to remove any significant amount of other oxides (column 2, lines 49-54).

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It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Li's etchant by employing an inorganic acid as taught by McNeilly for the purpose of selectively removing unwanted native oxide while etching the other oxide layers.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li ('495) as applied to claim 1 above, and further in view of Wanlass (US 3,997,381).

Li differs in failing to specify the percent weight ratio of HF:HNO₃:water is 0.01-50:1-70:0-99.

Wanlass teaches an etching solution comprising of hydrofluoric (49% by weight), nitric (70% by weight), (column 7, lines 10-14), which reads on the percent weight ratio of HF:HNO₃:water is 0.01-50:1-70:0-99.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Li's etchant by employing an inorganic acid as taught by Wanlass for the purpose of selectively etching doped oxide and undoped oxides (see Wanlass, column 7, lines 14-20).

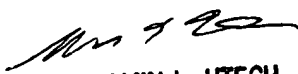
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner is normally unavailable reached on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-972-9310
for regular communications and 703-972-9311 for After Final communications.

ltue
September 23, 2002


BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700